

ABSTRACT OF THE DISCLOSURE

A device for detecting radiation direction is an integrated circuit that includes a first and second detector positioned nonparallel with respect to each other and a reference
5 detector. The first detector detects the direction of the radiation in a first dimensional direction, and the second detector detects the direction of the radiation in a second dimensional direction. The first and second detectors have differential pairs of phototransistors. The transistors in the differential pairs have P type base regions formed in opposing $\langle 111 \rangle$ planes of the silicon to detect incident radiation from a radiation
10 source. A photocurrent is induced in the base collector PN junction of each phototransistor, thereby causing a current output in the emitters of the phototransistors. The differential currents provide information describing the direction of the incident radiation. The reference detector is a $\langle 100 \rangle$ plane phototransistor, and its single current output is used to normalize the differential outputs of the first and second detectors. A
15 system is included to calculate azimuth and elevation information from the detector outputs.